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Finite-Element Modeling of Forced Axisymmetric Sessile Drop Oscillation Using a Moving Mesh[1] CHRIS FORSTER, MARC SMITH, ARI GLEZER, Georgia Institute of Technology — The behavior of a sessile drop undergoing axisymmetric oscillations is studied using the finite element method with a moving mesh to track the fluid interface. The drop is modeled in two different ways. In the first model, the surrounding fluid is assumed to have negligible viscosity and inertia. The drop motion is computed using a single fluid domain for the drop and solving the incompressible continuity and Navier-Stokes equations with appropriate interfacial boundary conditions. In the second model, the surrounding fluid is explicitly modeled. Here, two fluid domains are used, each having their own respective set of continuity and Navier-Stokes equations and these are fully coupled with the appropriate interfacial boundary conditions. The behavior of the drop is investigated for both pinned and dynamic contact line boundary conditions. A comparison of results from the two models and to the results from previous work is offered. The focus of this work is on extending this simulation to higher modes of oscillation where the effects of viscous damping from both the primary and surrounding fluids are more important.

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